

Researchers study isotopes in feces to discern mountain gorillas' diet

December 11 2012, by Bob Yirka



Male silverback Gorilla in SF zoo. Image: Wikipedia.

(Phys.org)—Researchers from several universities in the US have together found that it is possible to follow changes in a wild animal's diet over a single year period by studying isotopes in feces samples. The team used the technique, as they write in their paper published recently in the journal *PNAS*, to study the diet of wild mountain gorillas in Uganda.

The gorillas in Uganda's Bwindi Impenetrable National Park in the mountainous southwestern part of the country are difficult to study in the wild. Scientists want to know what they eat over the course of a single year because it would provide valuable information regarding how the animal survives, and perhaps more importantly, how it adapts to

environmental changes. Rather than watching every move the gorillas made over an extended period of time, the researchers instead collected [fecal samples](#) along with samples of plants and fruits that the gorillas are thought to eat, over a 10 month period during 2002-2003.

The samples were brought back to the lab where the researchers subjected them to chemical analysis to reveal the isotopes found in the food that the animals had eaten. Because different foods have different levels of isotopes, the researchers were able to determine which foods had been eaten at which time of the year. They found, for example that the gorillas tended to eat more fruit between February and March and then again between June and July.

Prior research had shown that an animal's diet could be found by studying isotopes in samples of hair, [tooth enamel](#) or bones – but that requires capturing animals and testing them, a less than optimal solution. This new research shows that the diet of [wild animals](#) can be discerned by simply collecting the droppings they leave behind, which allows for fine tuning such studies by allowing for testing on a more often and regular basis.

The researchers noted also that collecting and studying feces samples doesn't do away with the need for field study however, as the testing for [isotopes](#) isn't precise enough to tell researchers exactly which foods have been consumed – they need a base list to choose from to understand what has actually been eaten. Nor does it offer data on nutritional value.

More information: Detecting intraannual dietary variability in wild mountain gorillas by stable isotope analysis of feces, *PNAS*, Published online before print December 10, 2012, [doi: 10.1073/pnas.1215782109](https://doi.org/10.1073/pnas.1215782109)

Abstract

We use stable isotope ratios in feces of wild mountain gorillas (Gorilla

beringei) to test the hypothesis that diet shifts within a single year, as measured by dry mass intake, can be recovered. Isotopic separation of staple foods indicates that intraannual changes in the isotopic composition of feces reflect shifts in diet. Fruits are isotopically distinct compared with other staple foods, and peaks in fecal $\delta^{13}\text{C}$ values are interpreted as periods of increased fruit feeding. Bayesian mixing model results demonstrate that, although the timing of these diet shifts match observational data, the modeled increase in proportional fruit feeding does not capture the full shift. Variation in the isotopic and nutritional composition of gorilla foods is largely independent, highlighting the difficulty for estimating nutritional intake with stable isotopes. Our results demonstrate the potential value of fecal sampling for quantifying short-term, intraindividual dietary variability in primates and other animals with high temporal resolution even when the diet is composed of C3 plants.

© 2012 Phys.org

Citation: Researchers study isotopes in feces to discern mountain gorillas' diet (2012, December 11) retrieved 24 June 2024 from <https://phys.org/news/2012-12-isotopes-feces-discern-mountain-gorillas.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--